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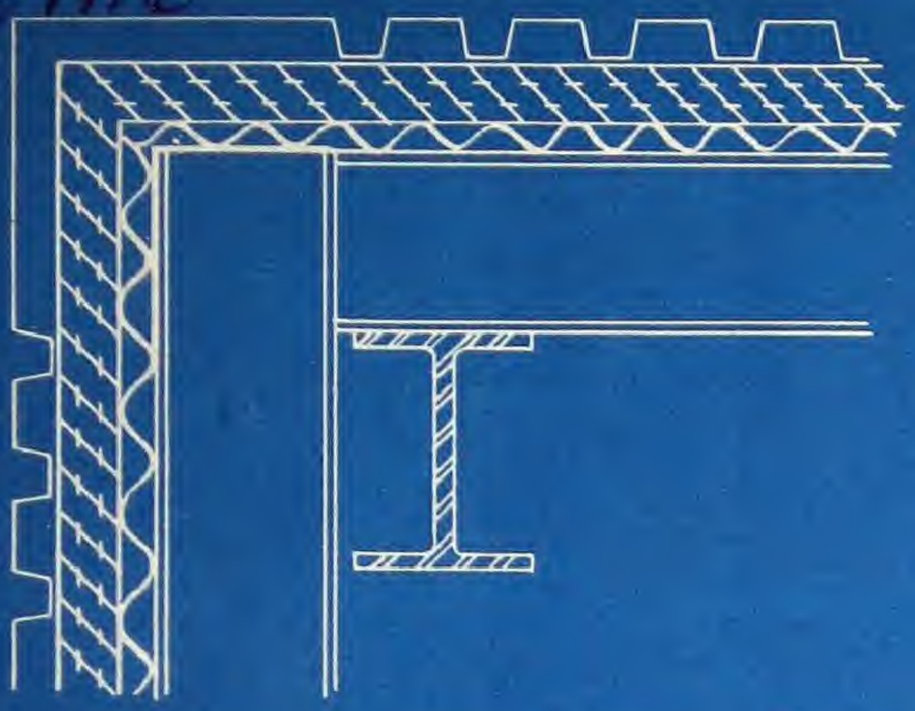
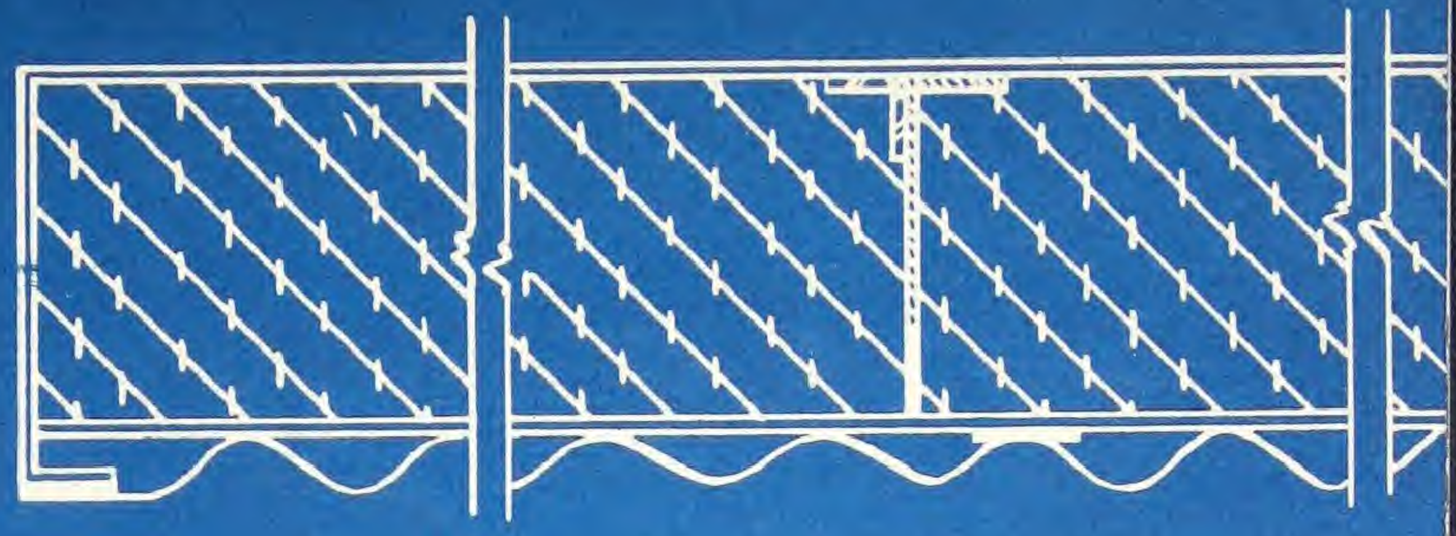
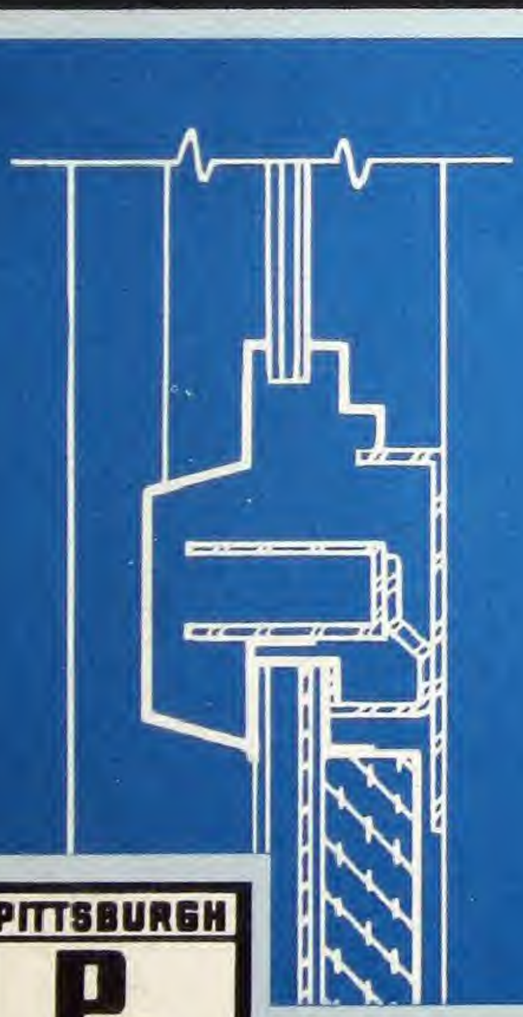
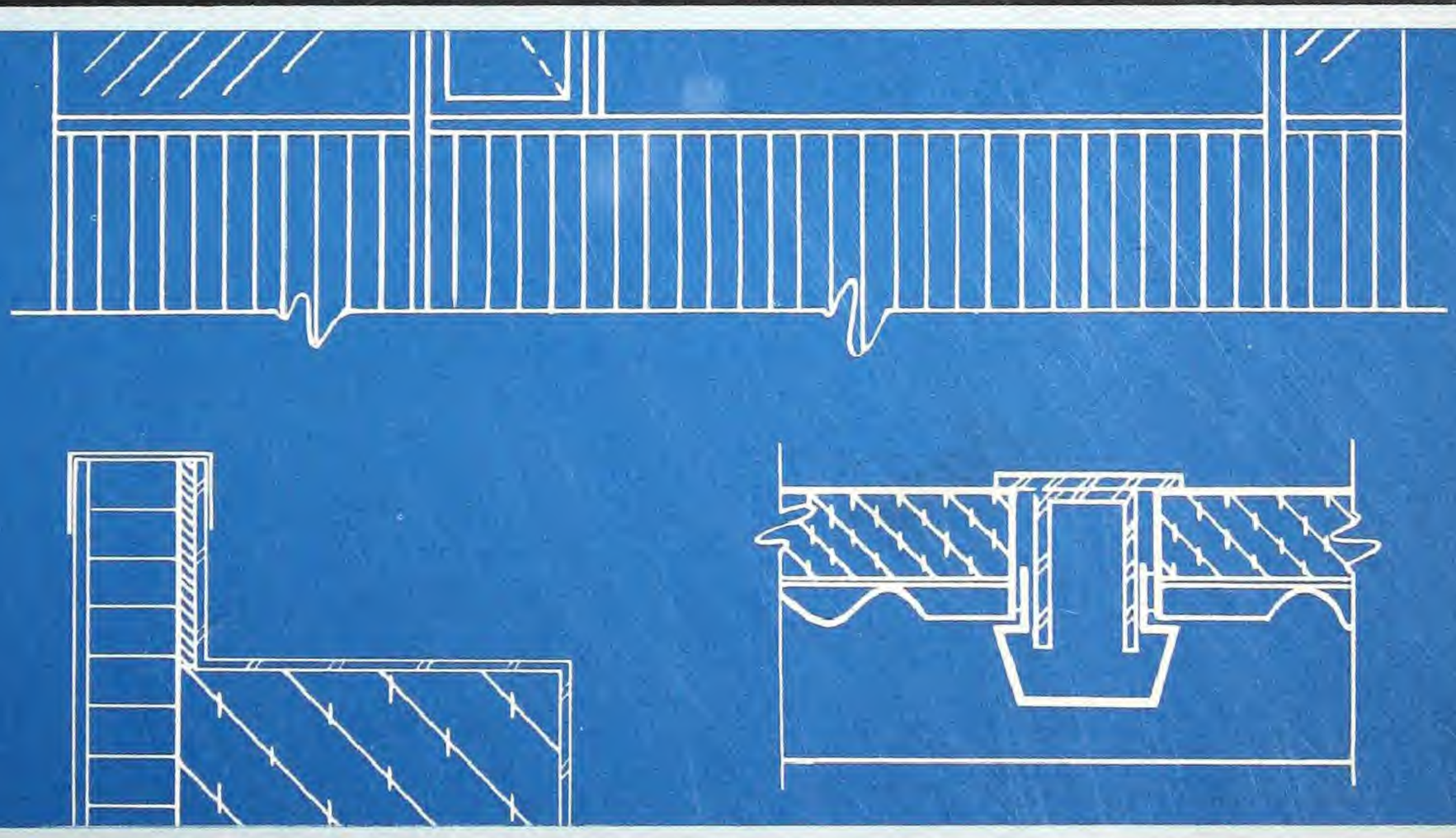




FOAMGLAS®

IN THIN WALL AND SANDWICH PANEL CONSTRUCTION





PITTSBURGH CORNING

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contents

what FOAMGLAS is

FOAMGLAS is an all-glass thermal insulating material unlike any other insulation in structure and performance. It combines the two characteristics of the long sought-after "ideal" insulation—it is inorganic and has a closed cellular structure.

It is made by expanding molten glass about fifteen times its volume and then cooling it. This results in a lightweight, rigid block containing millions of tiny glass cells, each of which is a minute dead-air insulating space.

But the special secret of FOAMGLAS is that these cells are *sealed*. Because these sealed cells are waterproof and vapor-proof, FOAMGLAS stays dry even under severe operating conditions and, thus, retains its original insulating value.

Being inorganic, FOAMGLAS is rot-proof, vermin-proof, and won't burn. Although lightweight and easy to handle, it has a compressive strength of over seven tons per square foot.

physical properties of FOAMGLAS

Absorption of Moisture	**0.2% by volume on 2"x 12"x 18" block (all on surfaces only)**
Acid Resistance	**Impervious to common acids and acid fumes**
Capillarity	**0**
Coefficient of Expansion	**0.0000046/°F.**
Combustibility	**Will not burn**
Composition	**A true glass; Completely inorganic**
Compressive Strength	**100 lbs. per sq. in.**
Density	**9 lbs. per cu. ft.**
Flexural Strength	**75 lbs. per sq. in.**
Hygroscopicity	**No increase in weight in 246 days in air at 90% relative humidity**
Modulus of Elasticity	**180,000 lbs. per sq. in.**
Thermal Conductivity:	
At 50°F.	**0.38 B.t.u./hr./sq. ft./°F./in.**

FOAMGLAS is covered by Federal Specification HH-I-551, entitled "Insulation Block and Pipe Covering, Thermal Cellular Glass," or revisions thereof.

FOAMGLAS is available in a wide variety of sizes and thicknesses in flat blocks, pipe covering, fitting covers and special curved shapes... for all temperatures from —300°F to 800°F.

thin walls and sandwich panels

A fast growing construction technique —

Ever since the development of steel frame construction, architects have been working on the design of lightweight walls for enclosing the building.

At the present, we are seeing a tremendous upsurge in the use of a technique that meets these requirements — thin wall and sandwich panel construction. You'll find typical examples on the following pages.

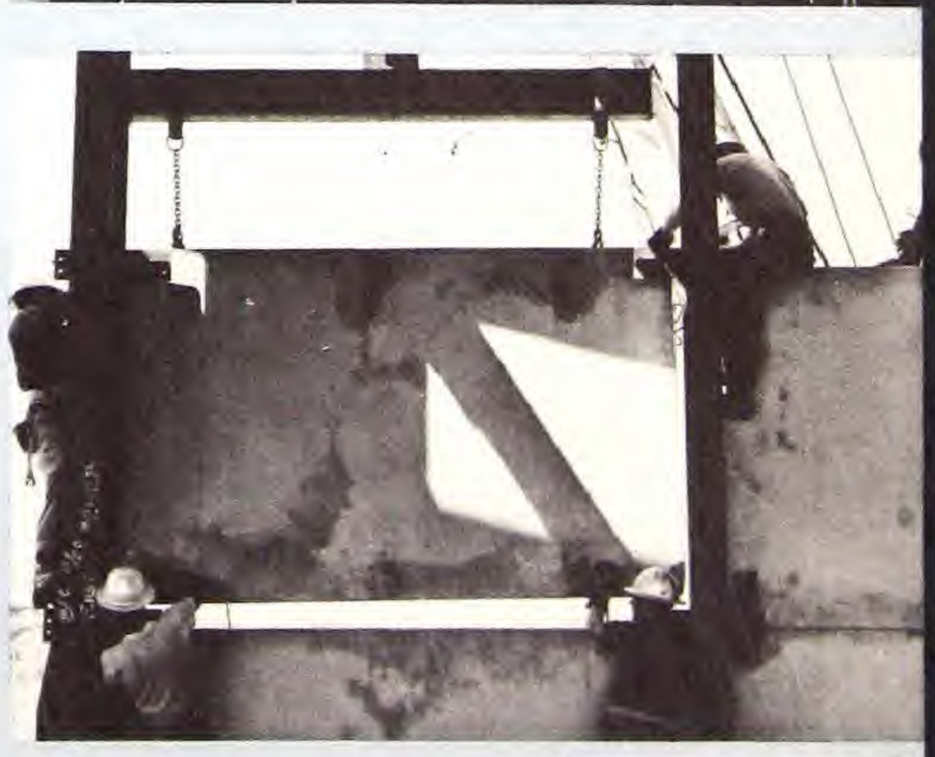
The basic advantages of thin wall construction—which, of course, will vary with the specific type used—include:

1. **Light weight** — which allows the use of smaller foundations and lighter structural steel framework.
2. **Lower erection cost** — resulting from the speed of erection and decreased handling costs. Many can be erected from inside the building, eliminating the cost of scaffolding.
3. **More usable floor space**—In a building of any size, the additional usable floor space is substantial. Calculations for a hypothetical 30-floor rental structure illustrate that added income of almost $20,000 could be obtained in some cases.
4. **Maintenance advantages** — Materials used are highly weather resistant; there are fewer joints; no need for pointing or caulking in future years; many designs are self-cleaning.
5. **Design versatility** — The wide variety of colors, facing designs and finishes now available offer new scope to the architect.

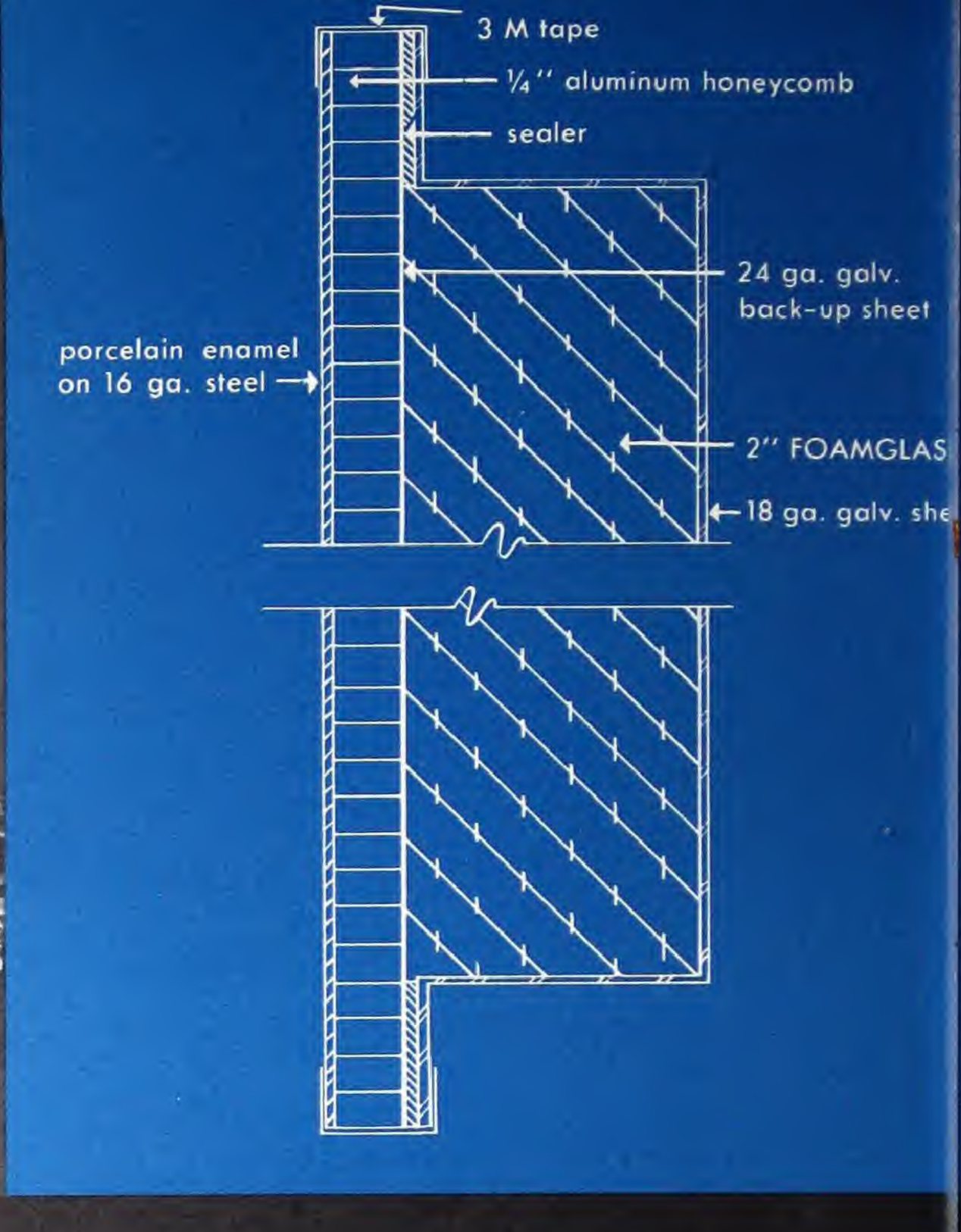
FOAMGLAS—ideal core insulation for thin walls

The unique physical properties of FOAMGLAS, the only cellular glass insulation, make it ideally suited as the insulating core in thin wall construction.

1. **Constant insulating value** — Only FOAMGLAS consists of hermetically sealed glass cells which cannot be penetrated by moisture. FOAMGLAS-insulated thin walls will retain their insulating values.
2. **Waterproof** — The fact that FOAMGLAS is moisture and vapor-proof means that there need be no concern about condensation within the insulation.
3. **Lightweight, yet strong**—Weight is an important factor in panel construction. FOAMGLAS combines light weight with a compressive strength of over seven tons per sq. ft.
4. **Rigid and self-supporting** — FOAMGLAS adds rigidity to the panel. It is dimensionally stable; will not slump within the panel.
5. **Non-combustible, durable** — Being inorganic, FOAMGLAS won't burn; is vermin-proof; will not rot or deteriorate; is highly resistant to acids and acid fumes.
6. **Versatile, easy to work with**—FOAMGLAS cuts and shapes easily with ordinary tools; works well with mechanical ties and anchors, and has high bond strength.



porcelain enamel panels



Ford Motor Company—Dearborn, Michigan

The new central staff office building of the Ford Motor Company is the largest known use of insulated porcelain enamel panels in a single building to date. The building, which will house the general offices of the company, uses over 90,000 square feet of FOAMGLAS-insulated panels.

The multi-million dollar 12-story building features a window wall construction, with porcelain enamel panels set into aluminum window frame members.

The panel sizes are standardized, with the largest being 4′6½″ x 3′9½″. Each panel has a front face of porcelain enamel on 16 gauge steel, followed by a ¼″ honeycomb aluminum, a 24 gauge galvanized steel sheet, a 2″ layer of FOAMGLAS, and an 18 gauge galvanealed steel painted back pan, all laminated to form one panel unit.

Job Data

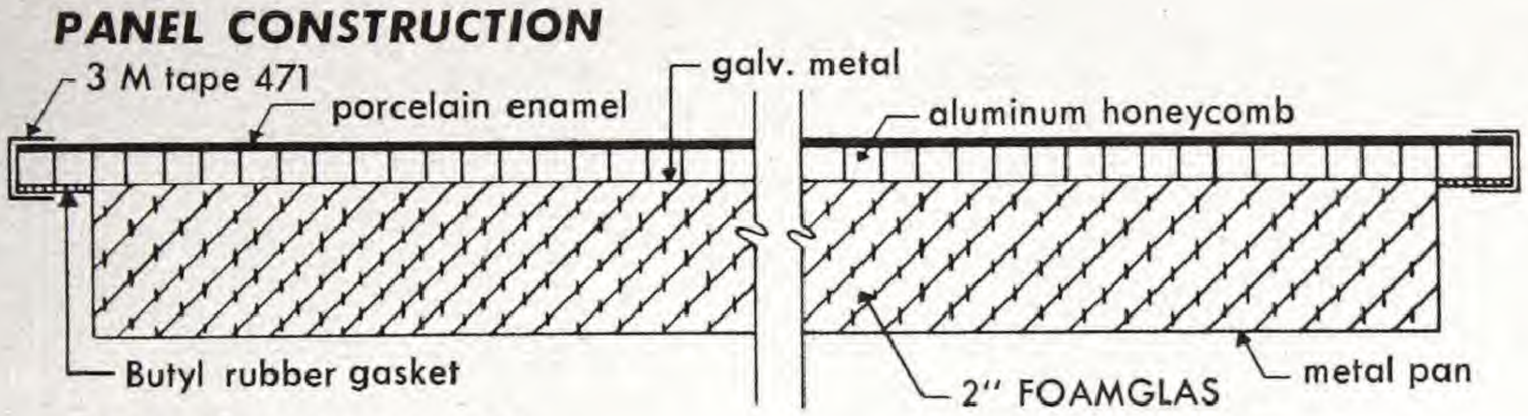
Panel Thickness	2½ inches
Weight	7½ pounds per square foot
Heat Transmission Coefficient (U)	0.15
Porcelain Enamel Color	Semi-matte green
Insulation	2 inches FOAMGLAS

Architect: Skidmore, Owings & Merrill, A.I.A., New York City, N.Y.
Contractor: Bryant & Detwilder, Detroit, Michigan
Panel Fabricator: Ingram-Richardson Manufacturing Co., Beaver Falls, Pa.

accelerated aging of a porcelain enamel panel

The following is a condensation of an Accelerated Aging Test, conducted by an independent research laboratory, November 24, 1954, at the request of the Ingram-Richardson Manufacturing Company, Beaver Falls, Pa. The test was conducted in accordance with recommended procedures used to test the durability of building panels.

PANEL CONSTRUCTION



SIZE OF TEST PANEL

36"x 36"x 2½"

TEST CYCLE

1. Spray with water at 122° F. ..... 1 hour
2. Spray with wet steam (194°-200° F.) ..... 3 hours
3. Store at 10° F. ..... 20 hours
4. Heat at 212° F. ..... 3 hours
5. Spray with wet steam (194°-200° F.) ..... 3 hours
6. Heat at 212° F. ..... 18 hours

Each cycle was completed in 48 hours. The panel was subjected to six complete cycles.

OBSERVATIONS

The exterior surface (Porcelain enamel) showed no perceptible change.

The prime coat on the back of the panel showed several small areas where the paint had chipped away.

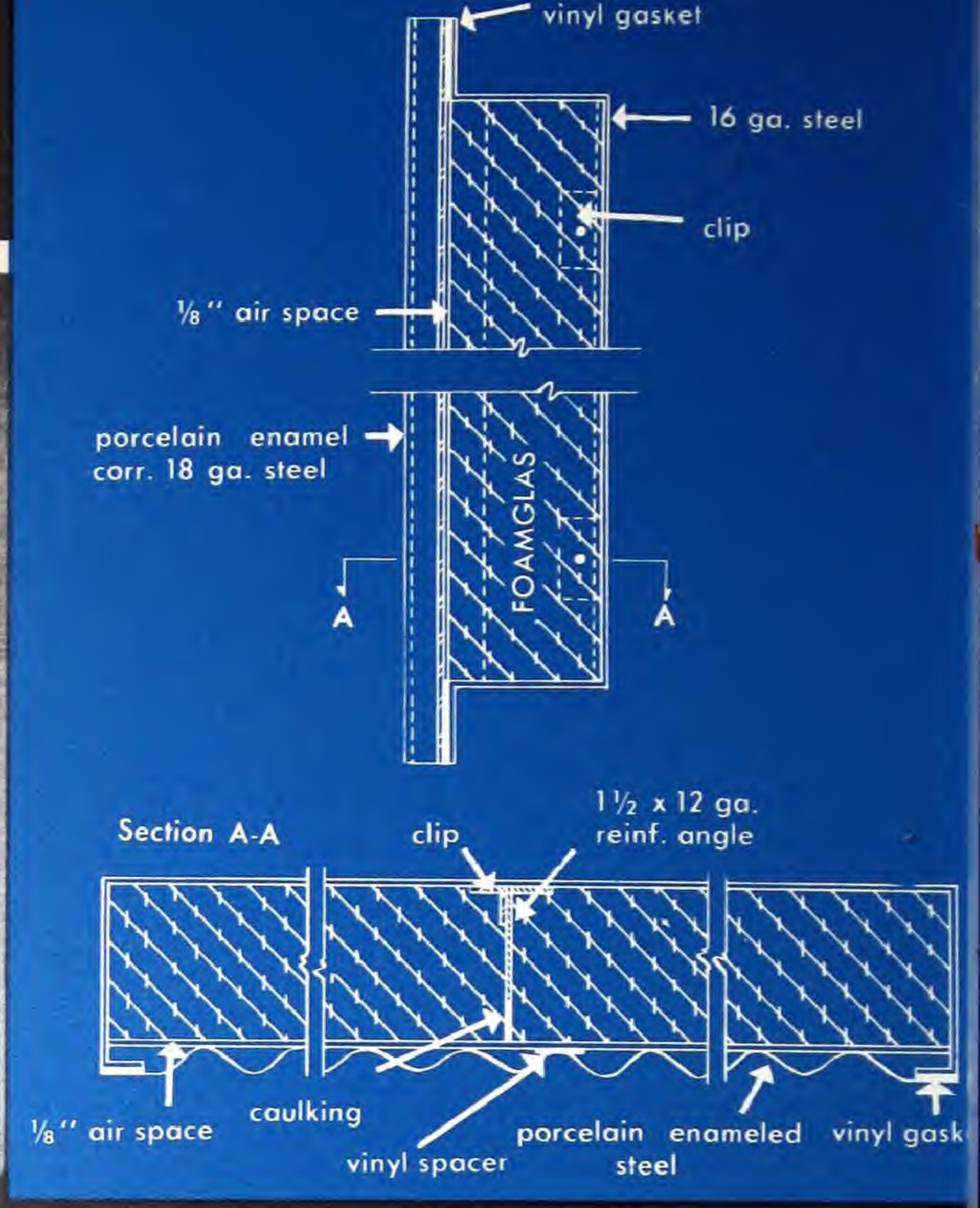
Cutting the panel into two equal parts with a metal band saw confirmed that the adhesive was good in the entire panel. The FOAMGLAS remained well bonded on all surfaces throughout the cycling. There was no evidence of moisture in the FOAMGLAS.

The butyl rubber was still resilient and sealed at all edges.

There was no increase in the weight of the panel at the end of the cycling test confirming that no moisture was absorbed or condensed in the panel.

The complete report is available upon request. Write to: Dept. TW, Pittsburgh Corning Corporation, One Gateway Center, Pittsburgh 22, Penna.

porcelain enamel panels



RCA Cherry Hill Project—Camden, N. J.

This recently constructed project houses the offices and engineering laboratories of the RCA Victor Television and Radio-Phonograph Divisions, and the RCA Service Company. It consists of five structures covering a total building area of 320,000 square feet.

Porcelain enamel panels form the major part of the front and rear wall areas. The completed sandwich panels are 94″ wide by 39″ high. A smooth skin of 16 gauge steel forms the interior; a two-inch thickness of FOAMGLAS is cemented to this. Between the insulation and the exterior sheet of corrugated 18 gauge porcelain enameled steel is a small air space. A vinyl gasket acts as separator.

Job Data

Panel Thickness ..... **2 11/16 inches**
Weight ..... **6½ pounds per square foot**
Heat Transmission Coefficient (U) **0.15**
Porcelain Enamel Colors .... **Butterscotch yellow and cream**
Insulation ..... **2 inches FOAMGLAS**

Architect: Vincent Kling, Philadelphia, Pa.
Contractor: Turner Construction Company, Philadelphia, Pa.
Panel Fabricator: Ingram-Richardson Manufacturing Co. Beaver Falls, Pa.

Fabrication of panel for RCA Victor project.

porcelain enamel panels

Douglass Elementary School—Kansas City, Mo.

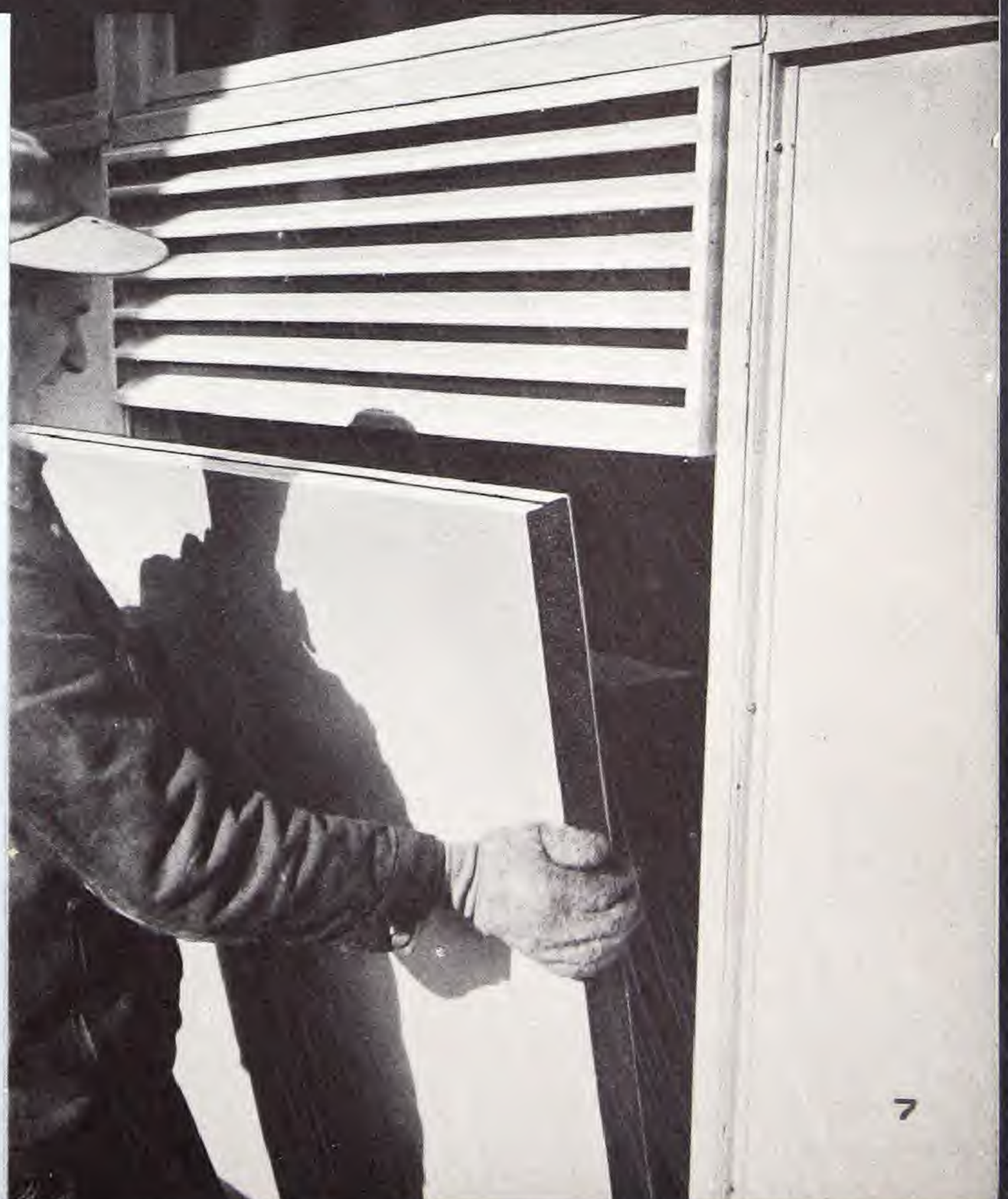
A total of 492 FOAMGLAS-insulated porcelain enamel panels, covering an area of 4,768 square feet, were used in the construction of the Douglass Elementary School. Panel sizes were standardized with the largest being 3′ 8″ x 7′4½″.

The panel is composed of an exterior skin of porcelain enamel on 18 gauge steel, 2 inches of FOAMGLAS, and an interior metal skin, the face of which is painted.

Job Data

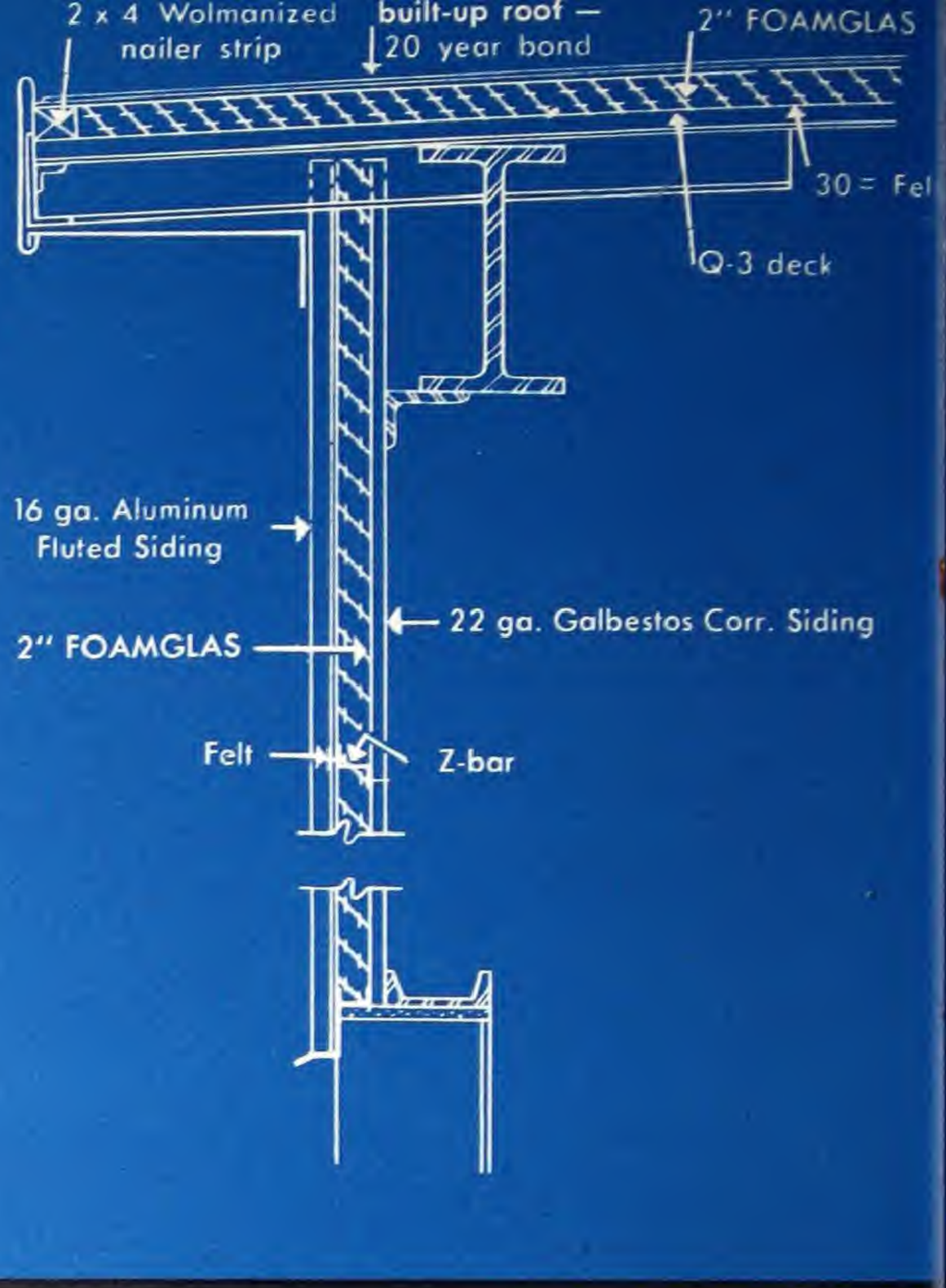
Panel Thickness	2⅛ inches
Weight	7 pounds per square foot
Heat Transmission Coefficient (U)	0.16
Porcelain Enamel Color	Satin biege
Insulation	2 inches FOAMGLAS

Architect: Kivett & Myers, A.I.A., Angus McCallum, Associate, Kansas City, Mo.
Contractor: Frank Quinlan Construction Company, Kansas City, Mo.
Panel Fabricator: Barrows Porcelain Enamel Company, Cincinnati, Ohio

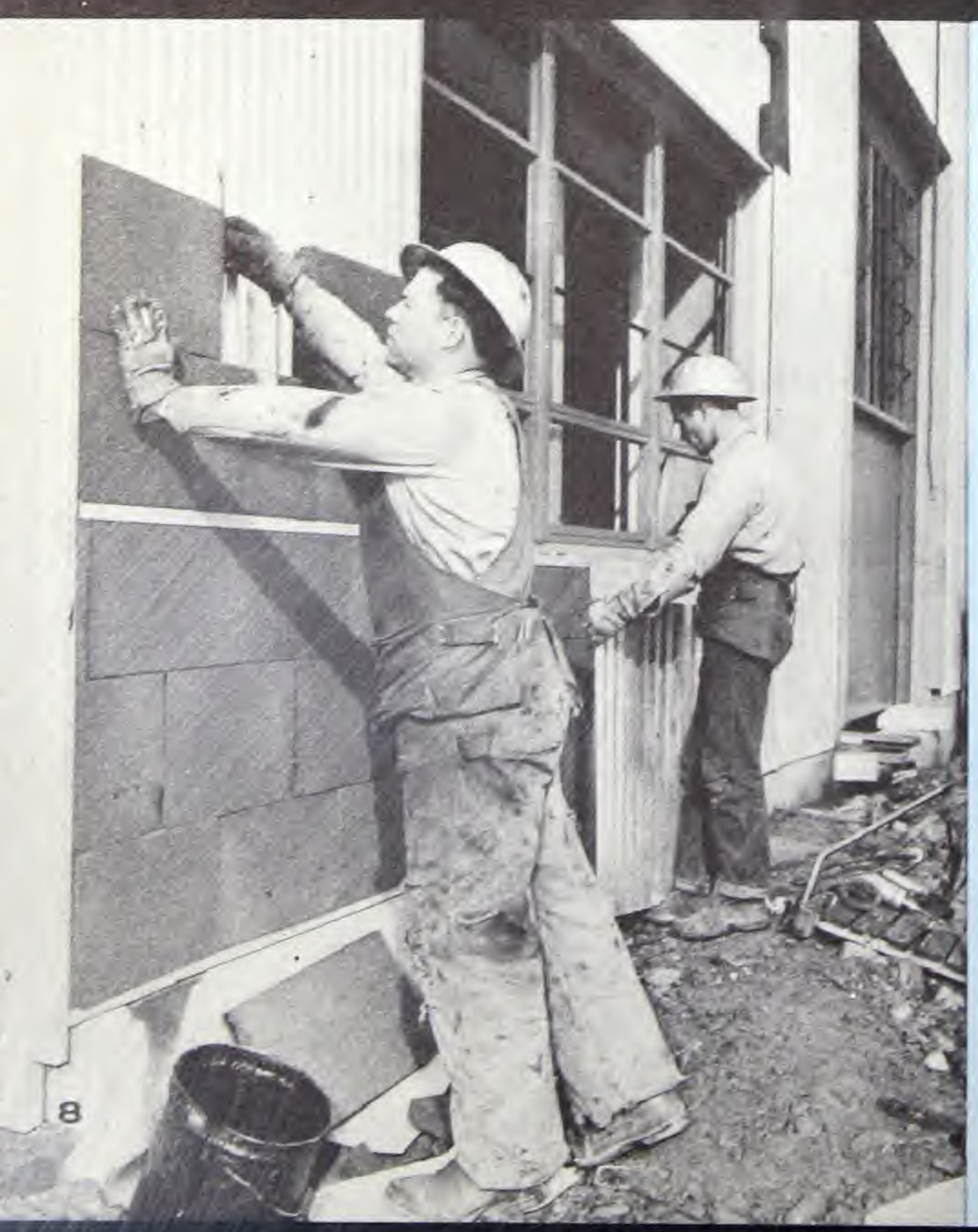


Closeup of panel being installed

aluminum & stainless steel facings



Anaconda Aluminum—Columbia Falls, Mont.



In the construction of Anaconda's new plant at Columbia Falls, Montana, field erected metal sandwich construction was used on a number of buildings, including a huge heated warehouse.

The inner face was of H. H. Robertson's Galbestos. A two-inch FOAMGLAS core was next applied with an adhesive to facilitate holding the blocks in place until the outer skin of fluted aluminum panels was erected. The two skins were held together by Z-bars.

In field fabrication these steps were followed:

1. Galbestos was fastened to structural frame.
2. Z-bars were attached to the Galbestos.
3. FOAMGLAS was applied to Galbestos using an adhesive.
4. Fluted aluminum facing was attached to Z-bars to form outer face of building.

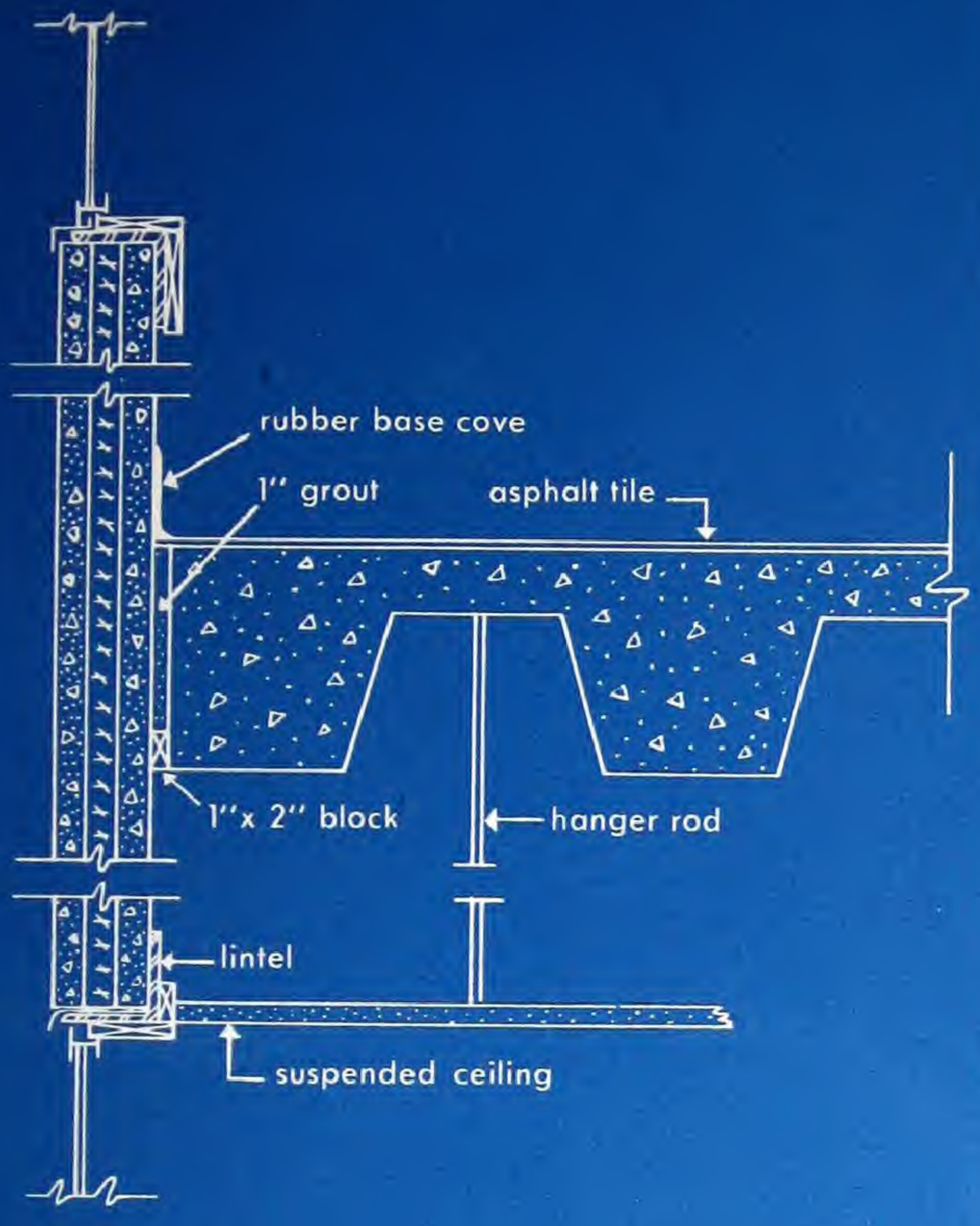
Job Data

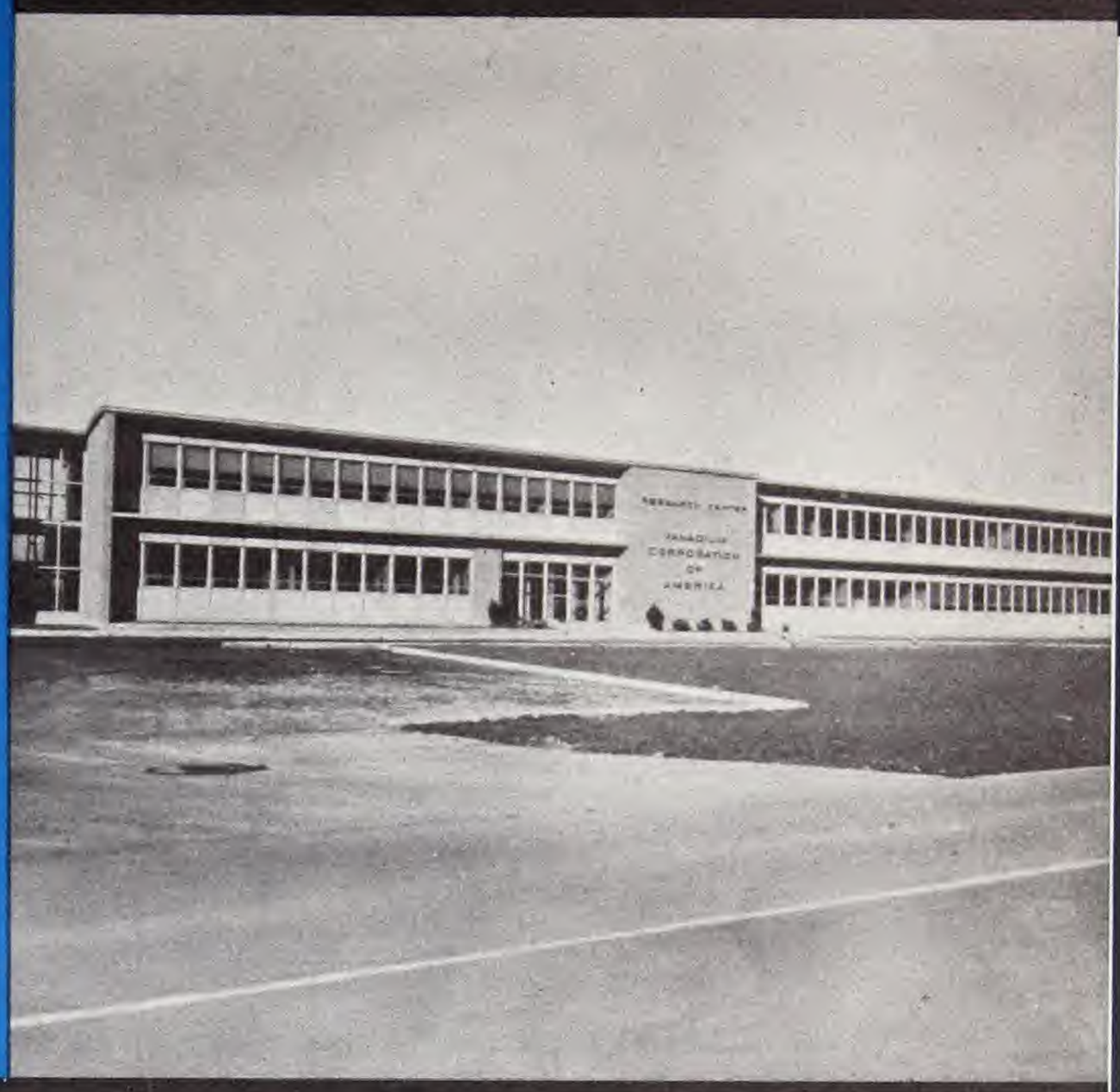
Panel Thickness	**3½ inches**
Weight	**5.6 pounds per square foot**
Heat Transmission Coefficient (U)	**0.16**
Finish	**Fluted natural aluminum**
Insulation	**2 inches FOAMGLAS**

General Contractor: Foley Construction Company, Pleasantville, N.Y.

◀ ***FOAMGLAS being applied.***

concrete panels





Vanadium Corporation of America—Cambridge, Ohio

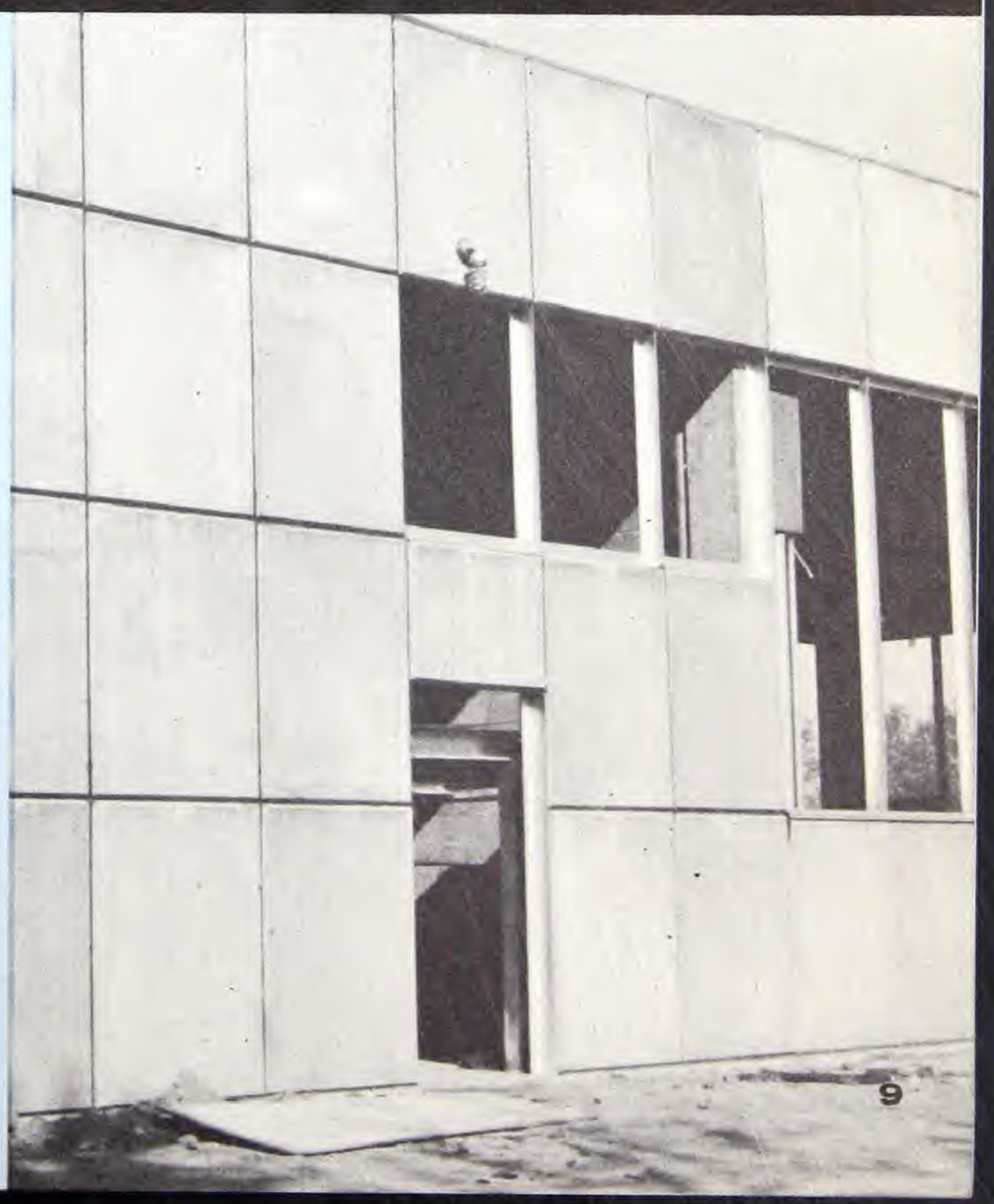
Precast concrete sandwich panels were used in the construction of Vanadium Corporation of America's new Research Center at Cambridge, Ohio.

Approximately 5,500 square feet of panels were used. The panels consist of 1¾" exterior face of concrete; 1½" core of FOAMGLAS; and 1¾" interior face of concrete. Panels used on the office building were approximately 4'x 4'. On the research building, three sizes were used: 2'7"x3'11¼", 3'10"x3'11¼", and 6'9"x3'11¼". All of the panels were precast by the Marietta Concrete Company in Marietta, Ohio and trucked to the job site.

Job Data

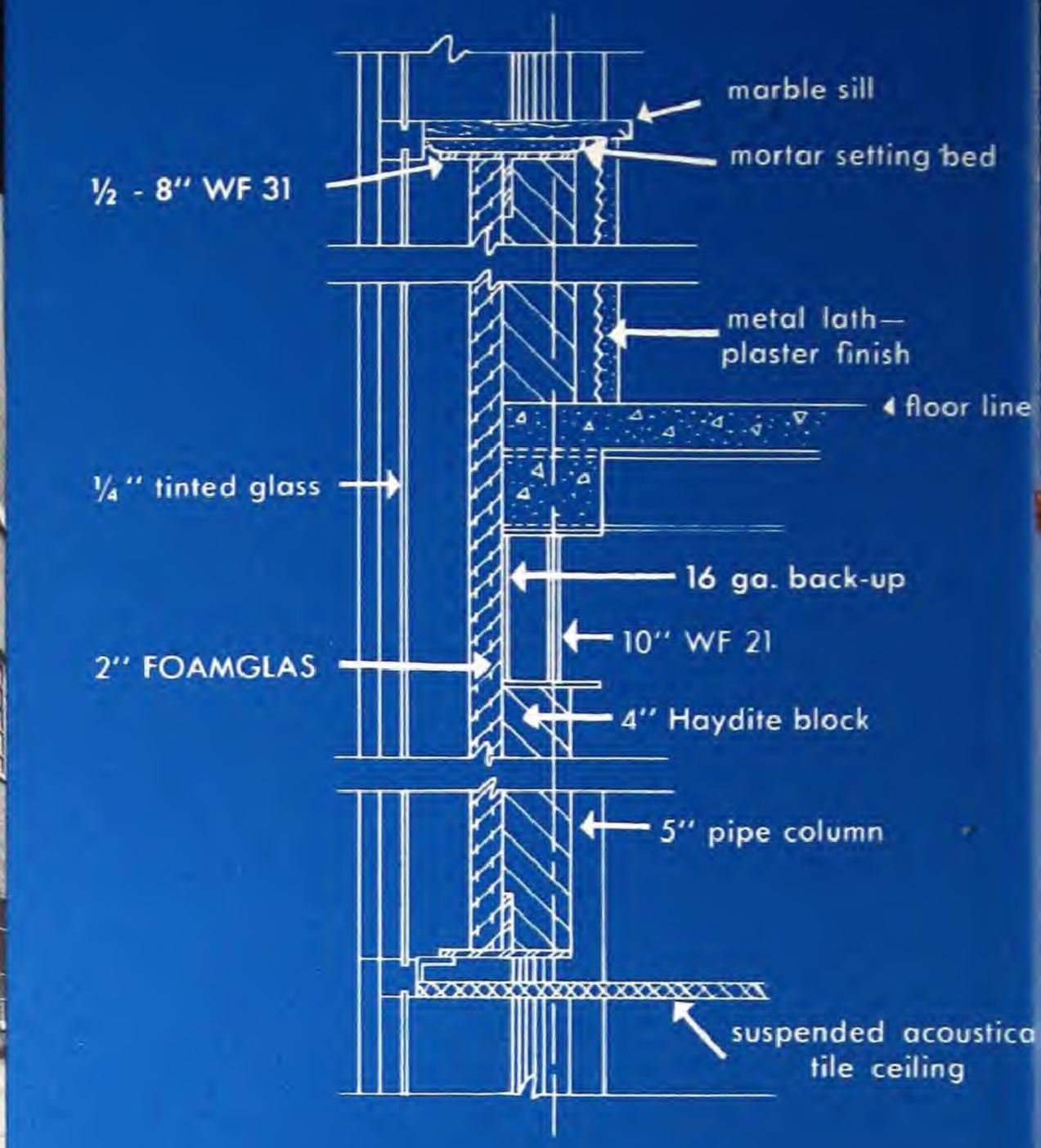
Panel Thickness	**5 inches**
Weight	**45 pounds per square foot**
Heat Transmission Coefficient (U)	**0.13**
Finish	**Vertical broom finish**
Insulation	**1½ inches FOAMGLAS**

Architect: Lacy, Atherton & Davis, A.I.A., Harrisburg, Pa.
Contractor: Sordoni Construction Company, Forty Fort, Pa.
Panel Fabricator: Marietta Concrete Company, Marietta, Ohio



Panel construction on laboratory building

spandrel construction



General Fireproofing Company — Cleveland, Ohio

This two-story glass clad building houses the offices and warehouse of the Cleveland branch of the General Fireproofing Company.

Rough Solex* plate glass sections at the spandrels alternate with regular Solex sections. Behind the rough Solex sections is an air space, followed by two inches of FOAMGLAS adhered to 4 inches of lightweight masonry with asphaltic cement.

Job Data

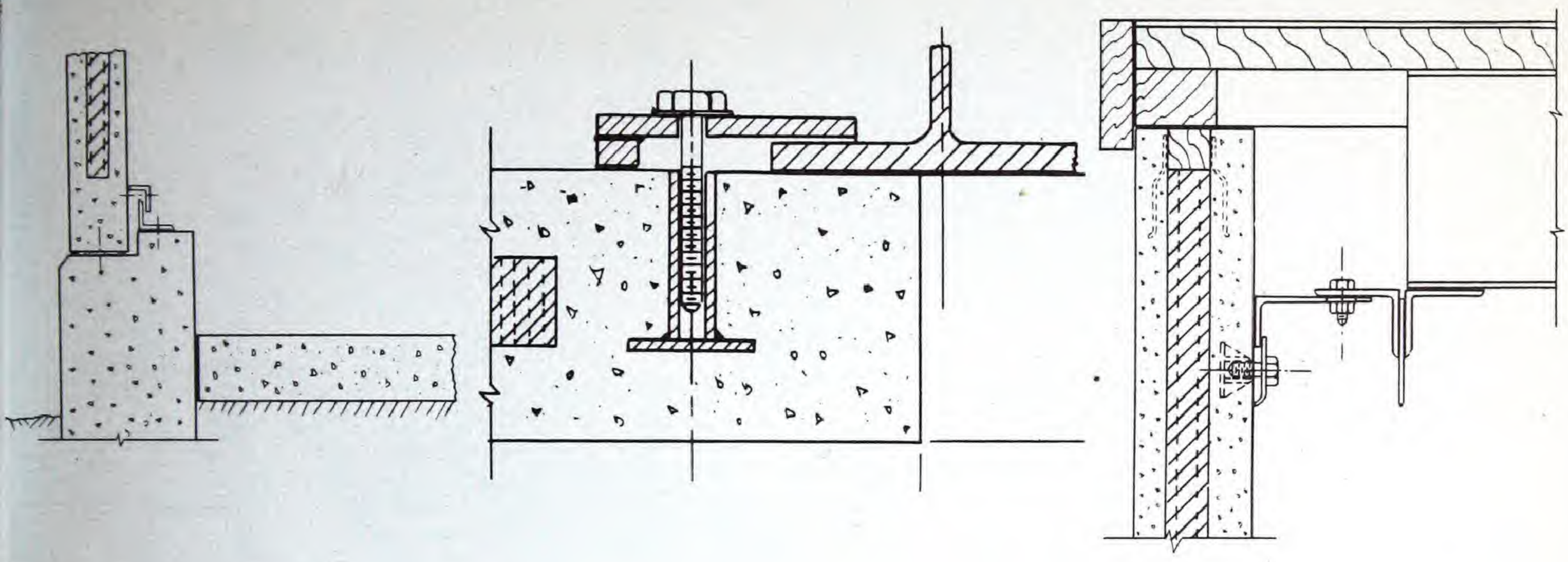
Wall thickness.....10½ inches
Heat transmission coefficient (U).....0.12
Finish...Glass (Rough Solex at spandrels, regular at window sections)
Insulation.....2 inches FOAMGLAS

Design and construction by The Austin Company

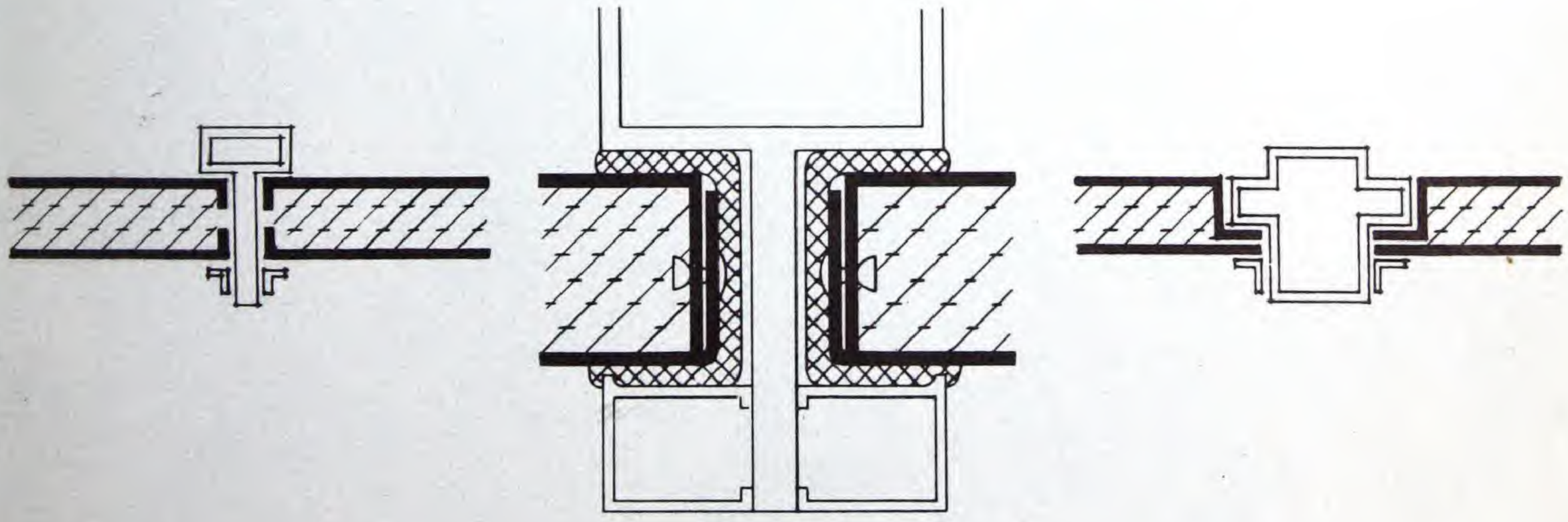
*Manufactured by Pittsburgh Plate Glass Company

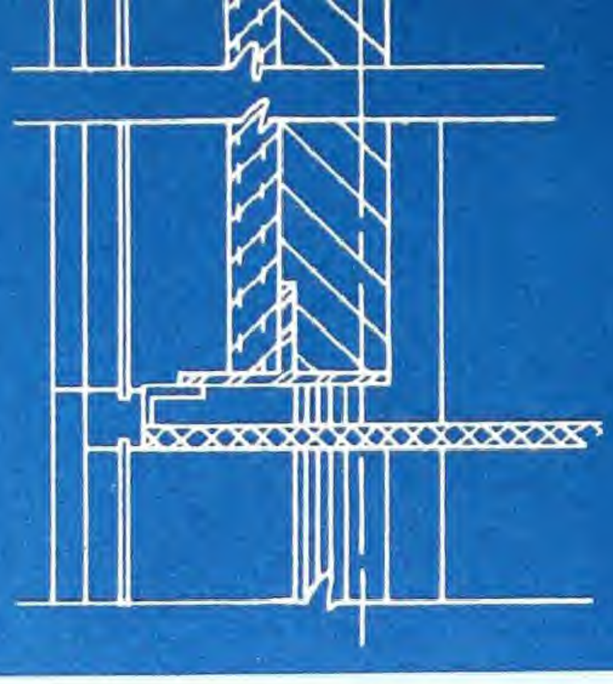
typical details

concrete panels



aluminum and steel facings





For more complete information on the use of Foamglas as the core insulation in Thin Wall and Sandwich Panel Construction write:

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